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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,757	06/23/2006	Naomi Okamoto	9369-120US U01-209418C/KK	1205
570 7590 06/22/2010 PANITCH SCHWARZE BELISARIO & NADEL LLP ONE COMMERCE SQUARE 2005 MARKET STREET, SUITE 2200 PHILADELPHIA, PA 19103			EXAMINER CHIN, HUI H	
			ART UNIT 1796	PAPER NUMBER
			NOTIFICATION DATE 06/22/2010	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptomail@panitchlaw.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/596,757	<b>Applicant(s)</b> OKAMOTO ET AL.	
	<b>Examiner</b> HUI CHIN	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 24 May 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 29-47 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 29-47 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>5/24/2010, 6/9/2010</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/24/2010 has been entered.

2. This Office Action is in response to the Amendment filed on 5/24/2010. Claims 29-47 are now pending.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 29, 33, 36, 38-40 and 42-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawaguchi et al. (JP 05-194658) in view of Rubber Material Performance and Design Application, (Zheng FU, Chemical Industry Press and Material Science and Engineering Publishing Center, Oct. 2003).

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Kawaguchi et al. disclose a process for producing a polybutadiene rubber composition, with the following technical features in Example I: dissolving 192g of 1,3-butadiene into 608g of anhydrous benzene, introducing nitrogen, then adding 1.9 mmols of water and stirring the solution for 30 minutes; thereafter heating the solution to 50°C, and then adding 3.1 mmols of diethylaluminum chloride, 0.01 mmols of cobalt octoate and 8.5 mmols of 1,5-cyclooctadiene into the solution with stirring, thereby subjecting the 1,3-butadiene to cis-1,4-polymerization; 30 minutes later, adding a 1,2-syndiotactic polymerization catalyst (3.6 mmols of triethylaluminum, 0.2 mmols of carbon bisulfide and 0.12 mmols of cobalt octoate) in the polymerization solution, adjusting the polymerization temperature to 50°C and stirring the solution for 30 minutes for polymerization reaction; and finally adding 0.5g of 2,4-t-butyl-p-cresol in methanol/benzene solution to stop the reaction and treating the polymerization solution in a conventional method to collect polybutadiene rubber (corresponding to "A" in the present application), wherein a boiling n-hexane soluble matter of the polybutadiene rubber obtained in Example I has a Mooney viscosity of 50 (ML<sub>1+4</sub>, 100°C), the content of a cis-1,4-bond is 96.9% (see Example 1, claims 1, 2), and the boiling n-hexane soluble matter is just the resulting cis-1,4-polybutadiene, and wherein the prepared polybutadiene rubber may be mixed with a high cis-polybutadiene rubber" (the high cis-polybutadiene rubber necessarily has a cis structure of greater than 80%, corresponding to "B" in the present application) for use as a tread base, a sidewall, a bead filler, etc. of a tire (see paragraph [0020]).

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However, Kawaguchi et al. are silent on the use of specific catalyst to make the polybutadiene.

The disclosure of *Rubber Material Performance and Design Application* indicates that a conventional technique for those skilled in the art to polymerize 1,3-butadiene with a cis-1,4-polymerization catalyst to obtain a high cis-polybutadiene rubber (Section 4, page 18). In light of such benefit, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use this specific catalyst to make the polybutadiene rubber with the expected success.

The limitations of claims 38, 39, 44, 45, and 47 can be found in Kawaguchi et al. at claims 1, 2, [0020], and Table 2, where it discloses the blending with at least one kind of rubber and 30-50 parts by weight of carbon black.

The limitations of claims 40 and 42 can be found in Kawaguchi et al. at [0020], where it discloses the natural rubber.

The limitations of claim 43 can be found in Kawaguchi et al. at [0020], where it discloses the styrene butadiene rubber.

The limitations of claim 46 can be found in Kawaguchi et al. at [0004], where it discloses the hardness.

5. Claims 29, 30, 32, 34 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ashitaka et al. (US Patent 4,379,889) in view of *Rubber Material Performance and Design Application*, (Zheng FU, Chemical Industry Press and Material Science and Engineering Publishing Center, Oct. 2003).

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Ashitaka et al. disclose a process for producing a polybutadiene rubber with enhanced mechanical strength, comprising the two successive steps of:

(A) polymerizing a first polymerization mixture comprising 1,3-butadiene and a polymerization medium in the presence of a cis-1,4-polymerization catalyst which comprises: (1) a cobalt compound, and (2) a dialkyl aluminum halide of the formula (I):

$\text{AlR}_2 \text{X}$  (I); and

(B) polymerizing a second polymerization mixture comprising the resultant cis-1,4-polybutadiene from Step (A), unreacted 1,3-butadiene and a polymerization medium in the presence of a 1,2-polymerization catalyst which comprises:

1. said cobalt compound;
2. said dialkyl aluminum halide;
3. carbon disulfide; and
4. an electron donor organic compound;

Wherein the prepared polybutadiene rubber can be blended with natural rubber or high cis-1,4-polybutadiene rubbers (claim 1, col. 6, lines 47-49).

However, Ashitaka et al. are silent on the use of specific catalyst to make the polybutadiene.

The disclosure of Rubber Material Performance and Design Application indicates that a conventional technique for those skilled in the art to polymerize 1,3-butadiene with a cis-1,4-polymerization catalyst to obtain a high cis-polybutadiene rubber (Section 4, page 18). In light of such benefit, it would have been obvious to one of ordinary skill

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in the art at the time the invention was made to use this specific catalyst to make the polybutadiene rubber with the expected success.

The limitations of claims 30, 32, 34 and 37 can be found in Ashitaka et al. at claim 11 and col. 3, line 58, where it discloses the cyclohexane and catalyst.

6. Claims 31, 35, 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawaguchi et al. (JP 05-194658) in view of Rubber Material Performance and Design Application, (Zheng FU, Chemical Industry Press and Material Science and Engineering Publishing Center, Oct. 2003), and further in view of Asakura et al. (US 2008/0233399).

The disclosure of Kawaguchi et al. in view of Rubber Material Performance and Design Application is adequately set forth in paragraph 4 and is incorporated herein by reference.

However, Kawaguchi et al. in view of Rubber Material Performance and Design Application are silent on a) the use of specific polymer to be dissolved in the mixture, and b) the use of a specific polybutadiene containing 80% or more of a cis-1,4-bond and having a Mooney viscosity of from 20 to 80.

Regarding to a), Asakura et al. disclose a process for producing a polybutadiene rubber composition, with the following technical features in Example I: a solution of 1.6 kg of 1,3-butadiene dissolved in 18 kg of dehydrated cyclohexane was placed in a 30-L stainless steel-made reaction tank with an agitator after the inside was substituted with nitrogen gas, into which 4 mmol of cobalt octoate, 84 mmol of diethylaluminum chloride

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and 70 mmol of 1,5-cyclooctadiene were mixed for cis polymerization. The resulting polymer had ML of 33 and T-cp of 59, and a microstructure of 1,2 structure at 0.9% by mass, trans-1,4 structure at 0.9% by mass and cis-1,4 structure at 98.2% by mass. After the cis polymerization, an unsaturated polymer substance comprising polyisoprene (IR) (ML=87; cis-1,4 structure at 98% by mass) was added to the resulting polymerization solution to 5% by mass (as the percentage to the resulting vinyl.cis-polybutadiene rubber). Immediately thereafter, 90 mmol of triethylaluminum and 50 mmol of carbon disulfide were added to the polymerization solution for 1,2 polymerization, wherein the rubber composition can contain silica and carbon black to provide a butadiene rubber composition with excellent properties for tire (claim 1, Example 1, [0018]).

Regarding to b), for those skilled in the art, the high cis polybutadiene rubber is one of the rubbers used in automobile tires in the art, it is a conventional selection that the high cis polybutadiene rubber has a Mooney viscosity ( $ML_{1+4}$ , 100°C) of 42-48 when used as a tire robber, and it is also a conventional technique to dissolve cis polybutadiene with a hydrocarbon-based organic solvent during solution mixing.

In light of such benefit, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use this specific polymer in a) and specific polybutadiene in b) to make the polybutadiene rubber with the expected success.

### ***Response to Arguments***

7. Applicants' arguments filed 5/24/2010 have been fully considered and are not persuasive.



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Applicants' remarks have been addressed in the rejections above.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUI CHIN whose telephone number is (571)270-7350. The examiner can normally be reached on Monday to Friday; 8:00am - 5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ling-Siu Choi/  
Primary Examiner, Art Unit 1796

/HC/

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